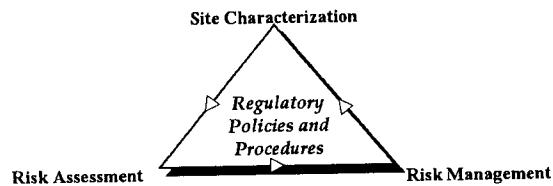


Risk Assessment Meeting Solutia – J.F. Queeny Plant

January 31, 2006



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Agenda

- Overview and Objective of Meeting
- Site Introduction and Chronology of Risk Assessment
- Risk Assessment (RA)
 - Analysis of 2002 approved RA & 2005 updated RA
 - Impact of New Data on 2002 RA
- Impact on Risk Management Activities
- Action Items and Path Forward

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RCRA RECORDS

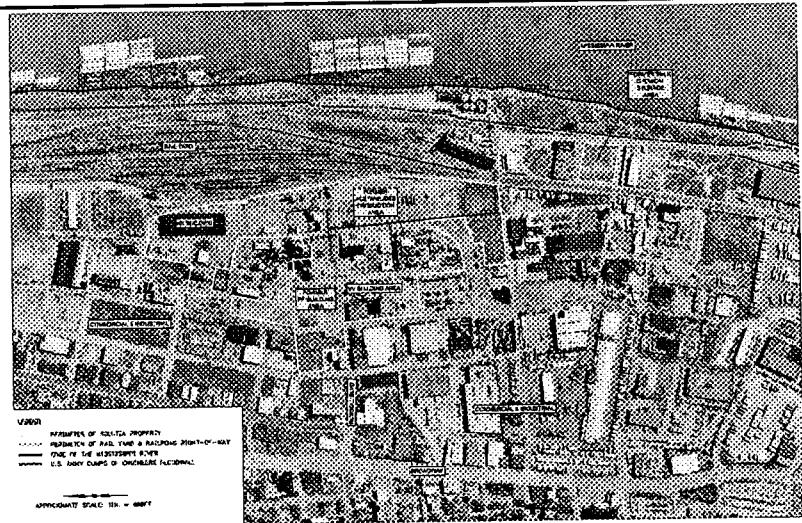
Facility Overview

- Monsanto's original plant, founded in 1901
- By 1960s, several expansions
- By 1970s, business decreasing
- 2005 – announced plant closure

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Aerial Photo



4

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Environmental Activities

1984 – 1990	Site-wide and area-specific hydrogeologic investigations (voluntary)
1990	RCRA Facility Investigations started
Oct. 2002	RFI Report and Human Health Risk Assessment (<i>2002 RA</i>) approved; EPA requested the Corrective Measures Study
2002	CA-725 completed
Jul. 2002	Data Gap Investigation Report submitted
2004 – 2005	Additional data collected
Sep. 2004	CA-750 accepted by EPA

Environmental Activities (continued...)

Jan. 2005	RA work plan submitted to EPA
Feb. 2005	Updated RA (FF, VV, and FBCSA) incorporating EPA's comments submitted (<i>2005 RA</i>)
Mar. 2005	MDNR site visit to observe sampling procedures and condition of wells
Sep. 2005	Updated RA for APA submitted (<i>2005 RA</i>)

*2002 RA was performed generally following RAGS approach.
2005 RA generally followed the draft MRBCA process.*

SWMU & AOC Locations

See attached photo

**Groundwater Monitoring Well &
Piezometer Location Map**

See attached photo

ANALYSIS OF 2002 RA vs. 2005 RA

Two Differences

1. Difference in procedure
2. Additional data

Key Questions

1. Is 2005 updated RA as protective as 2002 approved RA ?
 - Are calculated risks different?
 - How different are the calculated risks?
 - What is the impact on risk management activities?
2. How would the 2002 approved RA change with the additional data?

Methodology for Evaluation of Two Risk Assessments

- Step 1 Identify/list all the quantitative inputs to the risk assessments
- Step 2 Compare all inputs and identify those that are different
- Step 3 For each input, determine whether the difference will make the result more or less conservative
 - Steps 2 & 3 repeated for each input.*
- Step 4 Evaluate the combined effect of all inputs on calculated risk
- Step 5 Evaluate impact on clean-up levels and risk management
- Step 6 Summary and conclusions

Step 1: Inputs to RAs

Risk Assessment

- Constituents of concern
- Toxicity values (carcinogenic and non-carcinogenic effects)
- Physical and chemical properties
- Receptors
- Media of concern
- Exposure pathways
- Exposure factors
- Fate and transport parameters
- Fate and transport models
- Representative concentrations for calculation of risk (not for developing target levels)

Risk Management

- Target risk (carcinogenic and non-carcinogenic)

Step 2: Constituents of Concern

2002 RA	2005 RA
<ol style="list-style-type: none">1. Constituents with maximum detected concentrations below screening criteria (CALM, Region III RBC, USEPA SSL) were eliminated.2. For dermal contact pathway, only SVOCs were evaluated.3. For VV Building Area, groundwater data collected nearby were used.	<ol style="list-style-type: none">1. Constituents with at least one detection in a media of concern were evaluated.2. Metals with representative concentrations below background levels were eliminated.3. For VV Building Area, groundwater was not evaluated.

See attached Handout 1 for COCs for each area.

Step 3: Constituents of Concern (Conclusions)

Area	2002 RA	2005 RA
Former FF Building Area	9	15
VV Building Area (Soil + GW)	8	NA
VV Building Area (Soil only)	4	4
Former Bulk Chemical Storage Area	17	69
Former Acetanilides Production Area	21	55

Within each area, number of COCs varies by media as well as receptor.

Step 3: Constituents of Concern (Conclusions)

- 2005 RA used all the COCs used in 2002 RA.
- 2005 RA included several additional COCs.
- 2002 RA included individual PCBs and total PCBs. 2005 RA included individual PCBs not total PCBs.

Due to additivity of risk, including more COCs is more conservative and perhaps more rigorous.

Step 2: Toxicity Values

2002 RA	2005 RA
1. USEPA IRIS 2. HEAST 3. USEPA Region III RBC Table 4. USDOE RAIS Database Total of 36 chemicals	1. USEPA IRIS 2. USEPA PPRTV 3. USEPA NCEA 4. CALEPA OEHHA 5. HEAST 6. TCEQ's TRRP Total of 82 chemicals

Notes:

CALEPA: California Environmental Protection Agency

IRIS: Integrated Risk Information System

OEHHA: California Office of Environmental Health Hazard Assessment

RAIS: Risk Assessment Information System

TCEQ: Texas Commission on Environmental Quality

USEPA: United States Environmental Protection Agency

HEAST: Health Effects Assessment Summary Tables

NCEA: National Center for Environmental Assessment

PPRTV: Provisional Peer Reviewed Toxicity

RBC: Risk Based Concentration

TRRP: Texas Risk Reduction Program

USDOE: United States Department of Energy

See attached Handout 2 for comparison of oral and inhalation toxicity values.

Toxicity Values

- Higher the slope factor
 - More toxic chemical
 - Lower target level
 - Higher carcinogenic risk
- Higher the reference dose
 - Less toxic chemical
 - Higher target level
 - Lower non-carcinogenic risk

Step 3: Toxicity Values (Conclusions)

Toxicity Parameters	More Toxic Constituents in 2002 RA	More Toxic Constituents in 2005 RA
Oral slope factor	2	2
Inhalation slope factor	1	2
Oral reference dose	2	0
Inhalation reference dose	2	3

*Toxicity values for very few chemicals changed.
2005 RA used updated values.*

Step 2: Physical and Chemical Properties

2002 RA	2005 RA
Obtained from J&E Model	Obtained from the following hierarchy: <ul style="list-style-type: none">• CALM• EPA Region 9 PRG• TCEQ's TRRP Table

See attached Handout 3 for selected volatile COCs with different values.

Required only for indirect pathways.

Step 3: Physical and Chemical Properties (Conclusions)

- Identical values were used in 2002 RA and 2005 RA for the following:
 - Organic carbon partition coefficient
 - Diffusion coefficient in air
 - Diffusion coefficient in water
- Slightly different values for the following parameters:
 - Water solubility
 - Henry's law coefficient

No significant difference between the 2 RAs.

Step 2: Receptors

2002 RA	2005 RA
<ul style="list-style-type: none">• Outdoor site worker• Indoor site worker• Construction/utility worker• Site trespasser	<ul style="list-style-type: none">• Non-residential worker• Construction worker

Difference in exposure scenarios!

Step 2: Exposure Scenario for Receptors

Pathway	2002 RA		2005 RA
	Indoor Site Worker	Outdoor Site Worker	Non-residential Worker
Ingestion of soil		X	X
Inhalation of vapors			X
Inhalation of particulates			X
Dermal contact with soil		X	X
Indoor inhalation of vapors	X		X

X: Pathway considered

Also refer to exposure factor discussion.

Step 3: Receptors (Conclusions)

- 2002 RA used site trespasser as an additional receptor. However, site trespasser is not the risk driver. No overall impact.
- 2002 RA outdoor worker is exposed to soil impacts by ingestion and dermal contact only.
- 2002 RA indoor worker is exposed to soil and groundwater impacts by indoor inhalation only.
- 2005 RA non-residential worker is exposed to ingestion, dermal contact, indoor and outdoor exposures.

Step 2: Media of Concern

Media	2002 RA	2005 RA
Surficial soil	0 – 2 ft bgs	0 – 3 ft bgs
Subsurface soil	0 – Water table	3 ft bgs – Water table
Soil for construction activities	0 – 10 ft bgs	0 – 15 ft bgs
Groundwater	Shallow wells	Shallow wells

ft bgs: Feet below ground surface

Step 3: Media of Concern (Conclusions)

- There are minor differences in definition of surficial soil, subsurface soil, and soil to depth of construction activities.
- Depending on COC distribution, either could be more conservative.
- Comparison requires additional analysis because 2002 RA and 2005 RA used different data.

Step 2: Exposure Pathways

See attached Handout 4 for list of all exposure pathways.

Step 3: Exposure Pathways (Conclusions)

- 2005 RA did not consider the following pathways:
 - Indoor inhalation of vapors from groundwater by indoor worker in VV Building Area (only COC was PCB.)
 - Ingestion of groundwater by construction worker in any area.
- 2005 RA considered additional pathways not considered in 2002 RA:
 - Outdoor inhalation of vapors and particulates from surficial soil by non-residential worker
 - Outdoor inhalation of particulates from soil by construction worker

Step 2: Exposure Factors

See attached Handout 5 for a comparison of the exposure factors.

Step 3: Exposure Factors (Conclusions)

Non-residential Worker 2005 RA

- Higher soil ingestion rate (100 vs. 50 mg/day)
- Higher skin surface area (4714 vs. 3300 cm²/day)
- Higher soil adherence factor (0.2 vs. 0.07 mg/cm²)
- Lower daily inhalation rate (11.9 vs. 20 m³/day)

Construction Worker 2005 RA

- Higher exposure frequency (90 vs. 30 day/yr)
- Higher daily inhalation rate (13.7 vs. 8.2 m³/day)
- Higher skin surface area (4714 vs. 3300 cm²/day)
- Higher soil adherence factor (0.3 vs. 0.2 mg/cm²)
- Lower soil ingestion rate (100 vs. 200 mg/day)

2005 RA will calculate higher risk for construction worker.

Pathways and Exposure Factors for Site Worker/Non-residential Worker

Pathway	2002 RA		2005 RA
	Indoor Site Worker	Outdoor Site Worker	Non-residential Worker
Ingestion of soil	--	50 mg/day	100 mg/day
Dermal contact with soil	--	3300 cm ² /day 0.07 mg/cm ²	4714 cm ² /day 0.2 mg/cm ²
Outdoor inhalation of vapors and particulates	--	--	5 m ³ /day
Indoor inhalation of vapors	20 m ³ /day	--	6.9 m ³ /day

--: Pathway not considered

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Step 2: Fate and Transport Parameters

2002 RA	2005 RA
Obtained from J&E model	<ul style="list-style-type: none"> • Used site-specific values • If site-specific values not available, obtained from J&E model

See attached Handout 6 for comparison of fate and transport parameters.

Difference in indoor inhalation algorithm.

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Step 3: Fate and Transport Parameters (Conclusions)

- 2005 RA is more rigorous because wherever available site-specific values were used.
- When literature values were used:

<u>Parameters</u>	<u>More Conservative</u>
Enclosed space indoor exchange rate	2005 RA
Area Fraction of Cracks in Foundation/Walls	2005 RA
Enclosed Space Height	2005 RA

Step 2: Fate and Transport Models

Pathways with Different Model	2002 RA	2005 RA
Indoor inhalation by non-residential worker	J&E model	J&E model without advection
Inhalation by construction worker	Trench model with inhalation of vapors	Jury model with inhalation of vapors and particulates

Step 2: Representative Concentration

2002 RA	2005 RA
<ul style="list-style-type: none">RME: Lower of 95% UCL or maximum detectedCTE: Lower of arithmetic mean or RMENon-detect values: Half the detection limit	<ul style="list-style-type: none">Arithmetic mean concentration over exposure domainMultiple groundwater samples: Averaged each well before averaging all wells in exposure domainExcluded data with non-detect in periphery of areaNon-detect values: Replaced with half the detection limitQualitatively evaluated data when maximum exceeded 10 times average

See attached Handout 7 for comparison of representative concentration.

Step 3: Representative Concentration (Conclusions)

- In general, soil representative concentrations in 2002 RA are higher.
- For groundwater, representative concentrations in 2002 RA are higher in Former Acetanilides Production Area, but representative concentrations in 2005 RA are higher in FF Building Area and Former Bulk Chemical Storage Area.

Step 2: Target Risk

Target Risk	2002 RA	2005 RA
<u>Carcinogenic</u>		
IELCR for each chemical	NA	1×10^{-5}
Site-wide IELCR	1×10^{-4}	1×10^{-4}
<u>Non-carcinogenic</u>		
HI for each chemical	NA	1
Site-wide HI	1	1

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Step 3: Target Risk (Conclusions)

- No difference in site-wide target risk.
- Additionally, 2005 RA evaluated risk for each chemical.

2005 RA has one additional condition.

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Step 4: Combined Effect on Risk Calculation

See attached Handouts 8 and 9 for comparison of risks.

- 2005 RA calculated risk is higher for some cases, lower for others.
- Cannot say definitively one is universally more conservative than the other.
- More areas warrant risk management under 2005 RA than under 2002 RA.

Step 5: Impact on Clean-up Levels and Risk Management

Estimation of clean-up goals is independent of the calculated risk because clean-up goals are calculated based on target risk considering additivity of risk if necessary.

Target risk is identical in 2002 RA and 2005 RA.

Step 6: Summary and Conclusions

For Discussion!

See attached Handout 10.

ANALYSIS OF 2002 RA vs. 2005 RA

Two Differences

1. Additional data
2. Difference in procedure

Key Questions

1. Is 2005 updated RA as protective as 2002 approved RA ?
 - Are calculated risks different?
 - How different are the calculated risks?
 - What is the impact on risk management activities?
2. *How would the 2002 approved RA change with the additional data?*

Impact of New Data on 2002 RA

See attached Handouts 11 to 14.

Impact of New Data on 2002 RA

Receptor	FF		VV		FBCSA		APA	
	2005 RA	Updated 2002 RA						
Construction worker	RM	RA	RM	RM	RM	RA	RM	RM
Trespasser	--	RA	--	RA	--	RA	--	RA
Outdoor site worker	--	RA	--	RA	--	RA	--	RA
Indoor site worker	--	RM	--	RA	--	RM	--	RM
Non-residential worker	RA	--	RA	--	RM	--	RM	--

RA: Risk acceptable

RM: Risk management

--: Receptor not considered

Handout 1
Constituents of Concern
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Constituents	Former FF Building Area		VV Building Area		Former Bulk Chemical Storage Tank Area		Former Acetanilides Production Area	
	2002 RA	2005 RA	2002 RA	2005 RA	2002 RA	2005 RA	2002 RA	2005 RA
VOC's								
Acetone		X				X		X
Benzene	X	X			X	X	X	X
Bromodichloromethane						X		
Bromoform						X		
Carbon disulfide		X				X		X
Carbon tetrachloride						X		
Chlorobenzene	X	X			X	X	X	X
Chloroform						X		X
Chloromethane					X	X	X	
2-Chlorophenol						X		X
Dibromochloromethane						X		
1,2-Dichloroethane						X	X	X
cis-1,2-Dichloroethylene	X	X	X			X	X	X
Ethylbenzene		X				X		X
Methyl ethyl ketone		X				X		
Methyl isobutyl ketone						X		
Methylene chloride	X	X				X	X	X
Methyl iodide (Iodomethane)						X		
Nitrobenzene					X	X		
Tetrachloroethylene	X	X	X			X	X	X
Toluene	X	X				X		X
trans-1,2-Dichloroethylene	X	X					X	
1,2,4-Trichlorobenzene						X		
1,1,1-Trichloroethane						X		X
Trichloroethylene	X	X	X			X	X	X
Vinyl chloride	X	X	X			X	X	X
Xylenes (total)		X				X		X
Total of VOCs	9	14	4	0	4	26	10	17
SVOCs								
Acenaphthene						X		X
Alachlor							X	X
Anthracene						X		X
Aroclor 1242			X	X				
Aroclor 1248				X				
Aroclor 1254			X	X				
Aroclor 1260			X	X				
Polychlorinated biphenyls			X					
Benzo(a)anthracene					X	X	X	X
Benzo(a)pyrene					X	X	X	X
Benzo(b)fluoranthene					X	X	X	X
Benzo(g,h,i)perylene						X		X
Benzo(k)fluoranthene						X	X	X
Bis(2-ethylhexyl)phthalate					X	X		X
Butyl benzyl phthalate								X
4-Chloro-3-methylphenol						X		
Chrysene						X		X
Dibenzo(a,h)anthracene						X	X	X
Dibenzofuran						X		X
2,4-Dichlorophenol						X		
2,4-Dimethylphenol						X		
Dibutyl phthalate								X
Diethyl phthalate								X
Di-n-octylphthalate								X
Ethyl methacrylate	X					X	X	X
Fluoranthene						X		X
Fluorene						X		X
Indeno(1,2,3-cd)pyrene					X	X	X	X
2-Methyl-4,6-dinitrophenol						X		
2-Methylaphthalene						X		X
Naphthalene					X	X		X
2-Nitrophenol						X		
Pentachlorophenol						X		

Handout 1
Constituents of Concern
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Constituents	Former FF Building Area		VV Building Area		Former Bulk Chemical Storage Tank Area		Former Acetanilides Production Area	
	2002 RA	2005 RA	2002 RA	2005 RA	2002 RA	2005 RA	2002 RA	2005 RA
Phenanthrene						X		X
Phenol						X		X
Pyrene						X		X
2,4,6-Trichlorophenol						X		
Total of SVOCs	0	1	4	4	6	26	8	25
Metals/Inorganics								
Antimony					X	X		X
Arsenic					X	X	X	X
Barium					X	X		X
Beryllium					X	X	X	X
Cadmium					X	X		X
Chromium (III) total chromium					X	X		X
Cobalt						X		X
Copper						X		X
Mercury						X	X	X
Nickel						X		X
Selenium						X		X
Silver						X		
Thallium					X	X		
Tin						X		
Vanadium						X		X
Zinc						X		X
Cyanide						X		
Total of Metals/Inorganics	0	0	0	0	7	17	3	13
Total of all COCs	9	15	8	4	17	69	21	55

X: Chemical included as a COC

Handout 2
Toxicity Values for COCs Considered in Both 2002 RA and 2005 RA
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Constituents	Oral Slope Factor (mg/kg-day) ⁻¹		
	2002 RA	2005 RA	Ratio of 2005/2002
Alachlor	0.08	0.056	0.70
Aroclor-1242	2	2	1.00
Aroclor-1248	2	2	1.00
Aroclor-1254	2	2	1.00
Aroclor-1260	2	2	1.00
Benzo(a)anthracene	0.73	0.73	1.00
Benzo(a)pyrene	7.3	7.3	1.00
Benzo(b)fluoranthene	0.73	0.73	1.00
Benzo(k)fluoranthene	0.073	0.073	1.00
Dibenzo(a,h)anthracene	7.3	7.3	1.00
1,2-Dichloroethane	0.091	0.091	1.00
Indeno(1,2,3-cd)pyrene	0.73	1.2	1.64
Methylene chloride	0.0075	0.0075	1.00
Tetrachloroethylene	0.052	0.052	1.00
Trichloroethylene	0.011	0.013	1.18
Vinyl chloride	0.75	0.72	0.96
Constituents with more toxic values in 2005 RA			2
Constituents with less toxic values in 2005 RA			2

Ratio > 1: 2005 RA considers constituent to be more toxic.

Constituents	Inhalation Slope Factor (mg/kg-day) ⁻¹		
	2002 RA	2005 RA	Ratio of 2005/2002
1,2-Dichloroethane	0.091	0.091	1.00
Methylene chloride	0.00165	0.00165	1.00
Tetrachloroethylene	0.002	0.01	5.00
Trichloroethylene	0.006	0.007	1.17
Vinyl chloride	0.015	0.0013	0.08
Constituents with more toxic values in 2005 RA			2
Constituents with less toxic values in 2005 RA			1

Ratio > 1: 2005 RA considers constituent to be more toxic.

Handout 2
Toxicity Values for COCs Considered in Both 2002 RA and 2005 RA
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Constituents	Oral Reference Dose (mg/kg-day)		
	2002	2005	Ratio of 2002/2005
Alachlor	0.01	0.01	1.00
Aroclor-1254	0.00002	0.00002	1.00
Chlorobenzene	0.02	0.02	1.00
cis/trans-1,2-Dichloroethylene	0.009	0.01	0.90
1,2-Dichloroethane	0.03	0.03	1.00
Ethyl methacrylate	0.09	0.09	1.00
Methylene chloride	0.06	0.06	1.00
Naphthalene	0.02	0.02	1.00
Nitrobenzene	0.0005	0.0005	1.00
Tetrachloroethylene	0.01	0.01	1.00
Trichloroethylene	0.006	0.17	0.04
Vinyl chloride	0.003	0.003	1.00
Constituents with more toxic values in 2005 RA			0
Constituents with less toxic values in 2005 RA			2

Ratio > 1: 2005 RA considers constituent to be more toxic.

Constituents	Inhalation Reference Dose (mg/kg-day)		
	2002	2005	Ratio of 2002/2005
Chlorobenzene	0.017	0.017	1.00
1,2-Dichloroethane	0.0014	0.0014	1.00
Methylene chloride	0.86	0.11	7.53
Naphthalene	0.0009	0.00086	1.05
Nitrobenzene	0.0006	0.00057	1.05
Tetrachloroethylene	0.14	0.17	0.82
Vinyl chloride	0.03	0.029	0.98
Constituents with more toxic values in 2005 RA			3
Constituents with less toxic values in 2005 RA			2

Ratio > 1: 2005 RA considers constituent to be more toxic.

Handout 3
Physical and Chemical Properties of Constituents
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Constituents	Risk Assessment	Water Solubility, S (mg/L)	Henry's Law Constant, H (L-water/L-air)	Organic Carbon Adsorption Coefficient, K _{oc} (cm ³ /g)	Diffusion Coefficient in Air, D _i (cm ² /s)	Diffusion Coefficient in Water, D _w (cm ² /s)
Benzene	2002 RA	1790	0.227	58.9	0.088	9.80E-06
	2005 RA	1750	0.228	58.9	0.088	9.80E-06
Chlorobenzene	2002 RA	472	0.151	219	0.073	8.70E-06
	2005 RA	472	0.152	219	0.073	8.70E-06
Tetrachloroethylene	2002 RA	200	0.753	155	0.072	8.20E-06
	2005 RA	200	0.754	155	0.072	8.20E-06
Trichloroethylene	2002 RA	1472	0.421	166	0.079	9.10E-06
	2005 RA	1100	0.422	166	0.079	9.10E-06
Naphthalene	2002 RA	31	0.0198	2000	0.059	7.50E-06
	2005 RA	31	0.0198	2000	0.059	7.50E-06

Note:

Values in bold are different.

Handout 4
Exposure Pathways
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Receptor	Exposure Pathways	Former FF Building Area		VV Building Area		Former Bulk Chemical Storage Tank Area		Former Acetanilides Production Area	
		2002 RA	2005 RA	2002 RA	2005 RA	2002 RA	2005 RA	2002 RA	2005 RA
Outdoor site worker*	Ingestion of surface soil	X	X	X	X	X	X	X	X
	Dermal contact with surface soil		X	X	X	X	X	X	X
	Inhalation of vapors from surface soil		X		X		X		X
	Inhalation of particulates from surface soil		X		X		X		X
Indoor site worker*	Inhalation of vapors from subsurface soil	X	X		X	X	X	X	X
	Inhalation of vapors from groundwater	X	X	X		X	X	X	X
Construction/utility worker	Ingestion of soil	X	X	X	X	X	X	X	X
	Dermal contact with soil		X	X	X	X	X	X	X
	Inhalation of vapors from soil	X	X		X	X	X	X	X
	Inhalation of particulates from soil		X		X		X		X
	Ingestion of groundwater								X
	Dermal contact with groundwater		X				X	X	X
	Inhalation of vapors from groundwater		X				X	X	X
Trespasser**	Ingestion of surface soil	X		X		X		X	
	Dermal contact with surface soil			X		X		X	

Notes:

*: In 2005 RA, non-residential worker represents these receptors.

**: Not a critical receptor. See slide for receptors.

Handout 5
Comparison of Exposure Factors
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Parameter	Unit	2002 RA		2005 RA
		CTE	RME	
Body Weight:				
Non-residential Worker	kg	70	70	70
Construction Worker	kg	70	70	70
Exposure Duration (ED):				
Non-residential Worker	year	5	25	25
Construction Worker	year	1	1	1
Exposure Frequency:				
Non-residential Worker	day/year	250	250	250
Construction Worker	day/year	15	30	90
Soil Ingestion Rate:				
Non-residential Worker	mg/day	25	50	100
Construction Worker	mg/day	100	200	100
Inhalation Rate (daily):				
Non-Residential Worker Indoor	m ³ /day	20	20	6.9*
Non-residential Worker Outdoor	m ³ /day	NR	NR	5
Non-residential Worker Total	m ³ /day	20	20	11.9
Construction Worker	m ³ /day	2.6	8.2	13.7**
Skin Surface Area:				
Non-residential Worker	cm ² /day	2000	3300	4714
Construction Worker	cm ² /day	2000	3300	4714
Soil to Skin Adherence Factor:				
Non-residential Worker	mg/cm ²	0.07	0.07	0.2
Construction Worker	mg/cm ²	0.2	0.2	0.3

Notes:

CTE: Central tendency exposure

RME: Reasonable maximum exposure

NR: Not required

Values in bold are different (2005 RA vs. 2002 RA RME)

*: Estimated as hourly inhalation rate (0.8625 m³/hr) x exposure time spent indoors (8 hr/day).

**: Estimated as hourly inhalation rate (1.37 m³/hr) x exposure time spent outdoors (10 hr/day).

Handout 6
Fate and Transport Parameters
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Parameter	Unit	Former FF Building Area		
		2002 RA	2005 RA	2005 RA Source
Soil Source Dimension Parallel to Wind Direction	cm	NR	7620	Site-specific
Depth to Subsurface Soil Sources	cm	60.96	91.44	Site-specific
Depth of Surficial Soil Zone	cm	60.96	91.44	Literature
Vadose Zone (Soil Type: Clay for J&B Model)				
Total Soil Porosity	cm ³ /cm ³ -soil	0.459	0.411	Site-specific
Volumetric Water Content	cm ³ /cm ³	0.215	0.343	Site-specific
Volumetric Air Content	cm ³ /cm ³	0.244	0.068	Site-specific
Thickness	cm	293	267	Site-specific
Dry Soil Bulk Density	g/cm ³	1.43	1.62	Site-specific
Fractional Organic Carbon Content	g-C/g-soil	0.006	0.013	Site-specific
Average Soil Temperature	°C	14	NR	NR
Soil in Cracks				
Total Soil Porosity	cm ³ /cm ³ -soil	0.459	0.411	Site-specific
Volumetric Water Content	cm ³ /cm ³	0.215	0.343	Site-specific
Volumetric Air Content	cm ³ /cm ³	0.244	0.068	Site-specific
Capillary Fringe				
Total Soil Porosity	cm ³ /cm ³ -soil	0.459	0.411	Site-specific
Volumetric Water Content	cm ³ /cm ³	0.412	0.370	Site-specific
Volumetric Air Content	cm ³ /cm ³	0.047	0.041	Site-specific
Thickness	cm	81.5	68.2	Site-specific
Groundwater				
Depth to Groundwater	cm	375	335	Site-specific
Ambient Air				
Breathing Zone Height	cm	NR	200	Literature
Inverse of Mean Concentration at Center of Square Source	(g/m ² -s)/(kg/m ³)	NR	63.22	Literature
Mean Annual Wind Speed	m/s	NR	10	Site-specific
Trench				
Boundary Layer Thickness	cm	1	NR	NR
Cover Thickness	cm	1	NR	NR
Layer Thickness	cm	305	NR	NR
Floor Area of Trench	cm ²	900000	NR	NR
Length of Trench	cm	3000	NR	NR
Width of Trench	cm	300	NR	NR
Height of Trench	cm	300	NR	NR
Number of Air Exchange in Trench	sec ⁻¹	0.15	NR	NR
Enclosed Space				
Enclosed Space Air Exchange Rate	1/24hrs	24	12	Literature
Enclosed Space Foundation or Wall Thickness	cm	15	15	Literature
Area Fraction of Cracks in Foundation/Walls	cm ² /cm ²	0.0004	0.001	Literature
Depth Below Grade to Bottom of Enclosed Space Floor	cm	15	NR	NR
Soil-Building Pressure Differential	g/cm-s ²	40	NR	NR
Enclosed Space Floor Length	cm	961	NR	NR
Enclosed Space Floor Width	cm	961	NR	NR
Enclosed Space Height	cm	488	300	Literature
Floor-Wall Seam Crack Width	cm	0.1	NR	NR

Note:

NR: Not required

Handout 6
Fate and Transport Parameters
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Parameter	Unit	VV Building Area	
		2002 RA	2005 RA
Soil Source Dimension Parallel to Wind Direction	cm	NR	7894
Depth to Subsurface Soil Sources	cm	NR	91.44
Depth of Surficial Soil Zone	cm	60.96	91.44
Vadose Zone (Soil Type: Clayey Clay for J&T Model)			
Total Soil Porosity	cm ³ /cm ³ -soil	0.481	0.433
Volumetric Water Content	cm ³ /cm ³	0.216	0.29
Volumetric Air Content	cm ³ /cm ³	0.265	0.143
Thickness	cm	183	NR
Dry Soil Bulk Density	g/cm ³	1.38	1.49
Fractional Organic Carbon Content	g-C/g-soil	0.006	0.0098
Average Soil Temperature	°C	14	NR
Soil in Cracks			
Total Soil Porosity	cm ³ /cm ³ -soil	0.481	0.433
Volumetric Water Content	cm ³ /cm ³	0.216	0.29
Volumetric Air Content	cm ³ /cm ³	0.265	0.143
Capillary Fringe			
Total Soil Porosity	cm ³ /cm ³ -soil	0.481	NR
Volumetric Water Content	cm ³ /cm ³	0.412	NR
Volumetric Air Content	cm ³ /cm ³	0.069	NR
Thickness	cm	192	NR
Groundwater			
Depth to Groundwater	cm	375	NR
Indoor Air			
Breathing Zone Height	cm	NR	200
Inverse of Mean Concentration at Center of Square Source	(g/m ² -s)/(kg/m ³)	NR	63.22
Mean Annual Wind Speed	m/s	NR	10
Trench			
Boundary Layer Thickness	cm	1	NR
Cover Thickness	cm	1	NR
Layer Thickness	cm	305	NR
Floor Area of Trench	cm ²	900000	NR
Length of Trench	cm	3000	NR
Width of Trench	cm	300	NR
Height of Trench	cm	300	NR
Number of Air Exchange in Trench	sec ⁻¹	0.15	NR
Enclosed Space			
Enclosed Space Air Exchange Rate	1/24hrs	24	12
Enclosed Space Foundation or Wall Thickness	cm	15	15
Area Fraction of Cracks in Foundation/Walls	cm ² /cm ²	0.0004	0.001
Depth Below Grade to Bottom of Enclosed Space Floor	cm	15	NR
Soil -Building Pressure Differential	g/cm-s ²	40	NR
Enclosed Space Floor Length	cm	961	NR
Enclosed Space Floor Width	cm	961	NR
Enclosed Space Height	cm	488	300
Floor-Wall Seam Crack Width	cm	0.1	NR

Note:

NR: Not required

Handout 6
Fate and Transport Parameters
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Parameter	Unit	Former Bulk Chemical Storage Tank Area	
		2002 RA	2005 RA
Soil Source Dimension Parallel to Wind Direction	cm	NR	8748
Depth to Subsurface Soil Sources	cm	91.44	122
Depth of Surficial Soil Zone	cm	60.96	91.44
Vadose Zone (Soil Type: City Clay for I&E Model)			
Total Soil Porosity	cm ³ /cm ³ -soil	0.481	0.427
Volumetric Water Content	cm ³ /cm ³	0.216	0.365
Volumetric Air Content	cm ³ /cm ³	0.265	0.062
Thickness	cm	116	258
Dry Soil Bulk Density	g/cm ³	1.38	1.49
Fractional Organic Carbon Content	g-C/g-soil	0.006	0.0054
Average Soil Temperature	°C	14	NR
Soil in Cracks			
Total Soil Porosity	cm ³ /cm ³ -soil	0.481	0.427
Volumetric Water Content	cm ³ /cm ³	0.216	0.365
Volumetric Air Content	cm ³ /cm ³	0.265	0.062
Capillary Fringe			
Total Soil Porosity	cm ³ /cm ³ -soil	0.481	0.427
Volumetric Water Content	cm ³ /cm ³	0.412	0.384
Volumetric Air Content	cm ³ /cm ³	0.069	0.043
Thickness	cm	192	68.2
Groundwater			
Depth to Groundwater	cm	308	326
Ambient Air			
Breathing Zone Height	cm	NR	200
Inverse of Mean Concentration at Center of Square Source	(g/m ² -s)/(kg/m ³)	NR	63.22
Mean Annual Wind Speed	m/s	NR	10
Trench			
Boundary Layer Thickness	cm	1	NR
Cover Thickness	cm	1	NR
Layer Thickness	cm	305	NR
Floor Area of Trench	cm ²	900000	NR
Length of Trench	cm	3000	NR
Width of Trench	cm	300	NR
Height of Trench	cm	300	NR
Number of Air Exchange in Trench	sec ⁻¹	0.15	NR
Enclosed Space			
Enclosed Space Air Exchange Rate	1/24hrs	24	12
Enclosed Space Foundation or Wall Thickness	cm	15	15
Area Fraction of Cracks in Foundation/Walls	cm ² /cm ²	0.0004	0.001
Depth Below Grade to Bottom of Enclosed Space Floor	cm	15	NR
Soil -Building Pressure Differential	g/cm-s ²	40	NR
Enclosed Space Floor Length	cm	961	NR
Enclosed Space Floor Width	cm	961	NR
Enclosed Space Height	cm	488	300
Floor-Wall Seam Crack Width	cm	0.1	NR

Note:

NR: Not required

Handout 6
Fate and Transport Parameters
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Parameter	Unit	Former Acetanilides Production Area	
		2002 RA	2005 RA
Soil Source Dimension Parallel to Wind Direction	cm	NR	7620
Depth to Subsurface Soil Sources	cm	60.96	91.44
Depth of Surficial Soil Zone	cm	60.96	91.44
Vadose Zone (soil type: Clay for JG-E Model)			
Total Soil Porosity	cm ³ /cm ³ -soil	0.459	0.57
Volumetric Water Content	cm ³ /cm ³	0.215	0.215
Volumetric Air Content	cm ³ /cm ³	0.244	0.355
Thickness	cm	193	145
Dry Soil Bulk Density	g/cm ³	1.43	1.17
Fractional Organic Carbon Content	g-C/g-soil	0.006	0.022
Average Soil Temperature	°C	14	NR
Soil in Cracks			
Total Soil Porosity	cm ³ /cm ³ -soil	0.459	0.57
Volumetric Water Content	cm ³ /cm ³	0.215	0.215
Volumetric Air Content	cm ³ /cm ³	0.244	0.355
Capillary Fringe			
Total Soil Porosity	cm ³ /cm ³ -soil	0.459	0.57
Volumetric Water Content	cm ³ /cm ³	0.412	0.513
Volumetric Air Content	cm ³ /cm ³	0.047	0.057
Thickness	cm	81.5	68.2
Groundwater			
Depth to Groundwater	cm	274	213
Ambient Air			
Breathing Zone Height	cm	NR	200
Inverse of Mean Concentration at Center of Square Source	(g/m ² -s)/(kg/m ³)	NR	63.22
Mean Annual Wind Speed	m/s	NR	10
Trench			
Boundary Layer Thickness	cm	1	NR
Cover Thickness	cm	1	NR
Layer Thickness	cm	305	NR
Floor Area of Trench	cm ²	900000	NR
Length of Trench	cm	3000	NR
Width of Trench	cm	300	NR
Height of Trench	cm	300	NR
Number of Air Exchange in Trench	sec ⁻¹	0.15	NR
Enclosed Space			
Enclosed Space Air Exchange Rate	1/24hrs	24	12
Enclosed Space Foundation or Wall Thickness	cm	15	15
Area Fraction of Cracks in Foundation/Walls	cm ² /cm ²	0.0004	0.001
Depth Below Grade to Bottom of Enclosed Space Floor	cm	15	NR
Soil-Building Pressure Differential	g/cm-s ²	40	NR
Enclosed Space Floor Length	cm	961	NR
Enclosed Space Floor Width	cm	961	NR
Enclosed Space Height	cm	488	300
Floor-Wall Seam Crack Width	cm	0.1	NR

Note:

NR: Not required

Handout 7
Comparison of Representative Concentration
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Former Acetanilides Production Area - Construction Worker

Constituents	Soil Representative Concentrations (ug/kg)		
	2005 RA	2002 RA RME	Updated 2002 RA RME
Alachlor	9,992	46,100	56,374
Benzo(a)pyrene	657	1,100	1,100
Chlorobenzene	22,192	6,700	78,201
Tetrachloroethylene	271	10	10
Trichloroethylene	701	940	940
Arsenic	---	7,500	7,500
Beryllium	---	450	450
Mercury	2,592	7,600	7,600

Former Acetanilides Production Area - Construction Worker

Constituents	Groundwater Representative Concentrations (ug/L)		
	2005 RA	2002 RA RME	Updated 2002 RA RME
Alachlor	161,671	13	899,233
Chlorobenzene	38,880	70,000	73,639
1,2-Dichloroethane	227	1,250	19
cis/trans-1,2-Dichloroethene	542	1,250	82
Ethyl methacrylate	399	1,400	1,400
Methylene chloride	---	1,250	1,198
Tetrachloroethylene	258	1,250	380
Trichloroethylene	233	1,250	100
Vinyl chloride	112	125	3.3
Benzo(a)anthracene	2.5	0.39	2.3
Benzo(a)pyrene	3.1	5	1.2
Benzo(b)fluoranthene	3.3	5	1.5
Benzo(k)fluoranthene	3.2	5	1.3
Dibenzo(a,h)anthracene	2.9	5	0.88
Indeno(1,2,3-cd)pyrene	3.0	5	0.92
Arsenic	2.1	26	32

Former Acetanilides Production Area - Outdoor Site Worker

Constituents	Soil Representative Concentrations (ug/kg)		
	2005 RA	2002 RA RME	Updated 2002 RA RME
Benzo(a)pyrene	800	1,100	1,100
Chlorobenzene	3,391	13,900	59,000
Arsenic	6,150	7,500	7,500
Beryllium	---	450	450
Mercury	3,865	7,600	7,600

Handout 7
Comparison of Representative Concentration
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Former Acetanilides Production Area - Indoor Site Worker

Constituents	Soil Representative Concentrations (ug/kg)		
	2005 RA	2002 RA RME	Updated 2002 RA RME
Chlorobenzene	683	59,000	23,267
Tetrachloroethene	---	10	10
Trichloroethene	---	940	890

Former Acetanilides Production Area - Indoor Site Worker

Constituents	Groundwater Representative Concentrations (ug/L)		
	2005 RA	2002 RA RME	Updated 2002 RA RME
Benzene	—	1,250	1
Chlorobenzene	53,414	70,000	73,639
Chloromethane	—	2,500	3,835
1,2-Dichloroethane	309	1,250	19
cis/trans-1,2-Dichloroethene	218	1,250	82
Ethyl methacrylate	547	1,400	1,400
Methylene chloride	—	1,250	1,198
Tetrachloroethene	—	1,250	380
Trichloroethene	307	1,250	100
Vinyl chloride	—	125	3

VV Building Area - Construction Worker

Constituents	Soil Representative Concentrations (ug/kg)		
	2005 RA	2002 RA RME	Updated 2002 RA RME
Aroclor-1242	665,851	2,160,000	1,382,989
Aroclor-1260	44,223	21,000	190,000
Polychlorinated biphenyls	—	49,400	127,283

VV Building Area - Outdoor Site Worker

Constituents	Soil Representative Concentrations (ug/kg)		
	2005 RA	2002 RA RME	Updated 2002 RA RME
Polychlorinated biphenyls	---	75,000	75,000

FF Building Area - Construction Worker

Constituents	Groundwater Representative Concentrations (ug/L)		
	2005 RA	2002 RA RME	Updated 2002 RA RME
Tetrachloroethylene	5,430	359,000	1,392,331
Trichloroethylene	1,563	5,700	21,000

Handout 7
Comparison of Representative Concentration
Solutia - J.F. Queeny Plant, St. Louis, Missouri

FF Building Area - Outdoor Site Worker

Constituents	Soil Representative Concentrations (ug/kg)		
	2005 RA	2002 RA RME	Updated 2002 RA RME
Tetrachloroethylene	506,303	285,000	2,000,000
Trichloroethylene	8,231	1,000	1,000

FF Building Area - Indoor Site Worker

Constituents	Soil Representative Concentrations (ug/kg)		
	2005 RA	2002 RA RME	Updated 2002 RA RME
Tetrachloroethylene	163,275	2,000,000	1,181,468
Trichloroethylene	1,981	21,000	16,325

FF Building Area - Indoor Site Worker

Constituents	Groundwater Representative Concentrations (ug/L)		
	2005 RA	2002 RA RME	Updated 2002 RA RME
Benzene	496	770	1,075
Chlorobenzene	3,671	2,300	9,671
cis/trans-1,2-Dichloroethene	11,456	4,100	32,739
Methylene chloride	1,736	1,250	1,500
Tetrachloroethylene	5,430	3,800	17,569
Toluene	709,021	660,000	2,949,964
Trichloroethylene	1,563	3,100	2,093
Vinyl chloride	1,520	2,400	2,061

Former Bulk Chemical Sotrage Tank - Construction Worker

Constituents	Soil Representative Concentrations (ug/kg)		
	2005 RA	2002 RA RME	Updated 2002 RA RME
Chlorobenzene	165,837	307,000	679,540
Benzo(a)anthracene	13,175	36,000	32,361
Benzo(a)pyrene	9,060	22,000	21,413
Benzo(b)fluoranthene	10,257	24,000	23,919
Benzo(k)fluoranthene	5,778	18,000	9,285
Indeno(1,2,3-cd)pyrene	4,984	14,000	7,681
Naphthalene	15,290	39,000	117,760
Nitrobenzene	2,903	620	620
Antimony	6,870	8,700	15,399
Arsenic	12,284	15,000	15,387
Barium	715,320	1,100,000	1,004,501
Beryllium	1,132	1,700	1,930
Cadmium	3,788	6,800	5,121
Chromium	32,040	40,000	78,897
Thallium	924	1,000	2,017

Handout 7
Comparison of Representative Concentration
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Former Bulk Chemical Sotrage Tank - Outdoor Site Worker

Constituents	Soil Representative Concentrations (ug/kg)		
	2005 RA	2002 RA RME	Updated 2002 RA RME
Benzo(a)anthracene	7,530	6,100	6,100
Benzo(a)pyrene	5,797	4,000	4,000
Benzo(b)fluoranthene	6,987	4,600	4,600
Antimony	7,100	11,000	11,000
Arsenic	32,000	42,000	42,000
Beryllium	---	1,200	1,200
Chromium	113,000	270,000	270,000
Thallium	800	1,200	1,200

Former Bulk Chemical Sotrage Tank - Indoor Site Worker

Constituents	Soil Representative Concentrations (ug/kg)		
	2005 RA	2002 RA RME	Updated 2002 RA RME
Chlorobenzene	170,262	385,000	341,438
Naphthalene	16,176	250,000	59,011
Nitrobenzene	2,977	620	620

Former Bulk Chemical Sotrage Tank - Indoor Site Worker

Constituents	Groundwater Representative Concentrations (ug/L)		
	2005 RA	2002 RA RME	Updated 2002 RA RME
Benzene	41,824	15,000	18,000
Chlorobenzene	57,037	4,800	4,836
Chloromethane	38,464	6.8	807

Handout 8
Comparison of Risks
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Area and Receptor	Carcinogenic Risk		Non-carcinogenic Risk	
	2002 RA RME	2005 RA	2002 RA RME	2005 RA
FF Building Area				
Future Construction Worker	5.0E-08	6.04E-06	0.06	2.8
Future Outdoor Site Worker	1.3E-06	9.24E-06	0.007	0.05
Future Indoor Site Worker	7.0E-04	1.32E-06	0.5	0.019
Future Non-residential Worker	NA	2.24E-05	NA	0.12
VV Building Area				
Future Construction Worker	4.0E-07	3.18E-05	21	55.6
Future Outdoor Site Worker	4.0E-05	3.02E-06	1	0.2
Future Indoor Site Worker	3.0E-07	3.14E-06	0.0007	0.22
Future Non-residential Worker	NA	6.16E-06	NA	0.44
Former Bulk Chemical Storage Area				
Future Construction Worker	1.0E-06	2.70E-05	0.09	9.3
Future Outdoor Site Worker	2.0E-05	6.32E-05	0.1	0.18
Future Indoor Site Worker	4.0E-06	2.67E-06	3	0.14
Future Non-residential Worker	NA	6.61E-05	NA	0.37
Former Acetanilides Production Area				
Construction Worker	3.0E-05	3.76E-05	1	6.4
Outdoor Site Worker	4.0E-06	9.13E-06	0.03	0.024
Indoor Site Worker	8.0E-06	4.16E-07	1	0.43
Current Non-residential Worker	NA	9.61E-06	NA	1.4
Future Non-residential Worker	NA	1.04E-05	NA	1.4

Notes:

NA: Not applicable

Values in bold indicate that risks by 2005 RA are greater than risks by 2002 RA RME.

Values in italics indicate that risks exceeded target risk levels.

Handout 9
Areas and Receptors Warranting Risk Management
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Area	No Further Action (NFA) or Risk Management (RM)			
	Carcinogenic Risk		Non-carcinogenic Risk	
	RAGS RME	MRBCA	RAGS RME	MRBCA
FF Building Area				
Future Construction Worker	NFA	NFA	NFA	RM
Future Outdoor Site Worker	NFA	NFA	NFA	NFA
Future Indoor Site Worker	RM	NFA	NFA	NFA
Future Non-residential Worker	NA	NFA	NA	NFA
VV Building Area				
Future Construction Worker	NFA	NFA	RM	RM
Future Outdoor Site Worker	NFA	NFA	NFA	NFA
Future Indoor Site Worker	NFA	NFA	NFA	NFA
Future Non-residential Worker	NA	NFA	NA	NFA
Former Bulk Chemical Storage Area				
Future Construction Worker	RM*	RM*	RM*	RM
Future Outdoor Site Worker	RM*	RM*	RM*	RM*
Future Indoor Site Worker	NFA	NFA	RM	NFA
Future Non-residential Worker	NA	RM*	NA	RM*
Former Acetanilides Production Area				
Construction Worker	NFA	NFA	NFA	RM
Outdoor Site Worker	NFA	NFA	NFA	NFA
Indoor Site Worker	NFA	NFA	NFA	NFA
Current Non-residential Worker	NA	NFA	NA	RM
Future Non-residential Worker	NA	NFA	NA	RM

Notes:

NA: Not applicable

*: Due to lead in soil

Handout 10
Summary of Input Parameters
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Input Parameters	Comment
Constituents of concern	2005 RA included more COCs.
Toxicity values	2005 RA used updated values.
Physical and chemical parameters	No significant difference between 2002 RA and 2005 RA.
Receptors	There are small differences between 2002 RA and 2005 RA.
Media of concern	There are small differences between 2002 RA and 2005 RA.
Exposure pathways	There are minor differences between 2002 RA and 2005 RA.
Exposure factors	2005 RA used more conservative values.
Fate and transport parameters	2005 RA used more rigorous and conservative values.
Fate and transport models	2002 RA used trench model. J&E model differs in terms of advective flux.
Representative concentration	In general, 2002 RA used higher values for soil.
Target risk	2005 RA has one additional condition.

Handout 11(a)

**Impact of New Data on 2002 Risk Assessment for Construction Worker in Former FF Building Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri**

Ingestion of Soil by Construction Worker - Former FF Building Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Tetrachloroethylene	24	359,000 *	27	1,392,331 U	3.9	3.13E-08	1.21E-07	0.006	0.023
Trichloroethylene	20	5,700 **	23	21,000 M	3.7	1.05E-10	3.87E-10	0.0002	0.00074
Total						3.14E-08	1.22E-07	0.0062	0.024

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

*: RME for tetrachloroethene is 2,000,000 ug/kg from Table A1-5-2 in RFI Data Gap Investigation Report (URS, July 2002).

**: RME for trichloroethene is 21,000 ug/kg from Table A1-5-2 in RFI Data Gap Investigation Report (URS, July 2002).

Inhalation of Vapors from Soil by Construction Worker - Former FF Building Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Tetrachloroethylene	24	359,000 *	27	1,392,331 U	3.9	1.43E-08	5.55E-08	0.005	0.019
Trichloroethylene	20	5,700 **	23	21,000 M	3.7	6.68E-10	2.46E-09	-	-
Total						1.50E-08	5.79E-08	0.005	0.019

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

*: RME for tetrachloroethene is 2,000,000 ug/kg from Table A1-5-2 in RFI Data Gap Investigation Report (URS, July 2002).

**: RME for trichloroethene is 21,000 ug/kg from Table A1-5-2 in RFI Data Gap Investigation Report (URS, July 2002).

Updated 2002 RA RME Site-wide Risks for Construction Worker - Former FF Building Area

Complete Pathway and Site-wide Risk	Carcinogenic Risk		Non-carcinogenic Risk	
	2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Ingestion of soil	3.14E-08	1.22E-07	0.0062	0.024
Inhalation of vapors from soil	1.50E-08	5.79E-08	0.005	0.019
Site-wide Risk	4.64E-08	1.80E-07	0.011	0.043

Handout 11(b)

**Impact of New Data on 2002 Risk Assessment for Outdoor Site Worker in Former FF Building Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri**

Ingestion of Surface Soil by Outdoor Site Worker - Former FF Building Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Tetrachloroethene	7	285,000 *	7	2,000,000 M	7.0	1.29E-06	9.05E-06	0.007	0.049
Trichloroethene	7	1,000 M	7	1,000 M	1.0	9.61E-10	9.61E-10	0.00004	0.00004
Total						1.29E-06	9.05E-06	0.007	0.049

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

*: RME for tetrachloroethene is 2,000,000 ug/kg from Table A1-5-1 in RFI Data Gap Investigation Report (URS, July 2002).

Updated 2002 RA RME Site-wide Risks for Outdoor Site Worker - Former FF Building Area

Complete Pathway and Site-wide Risk	Carcinogenic Risk		Non-carcinogenic Risk	
	2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Ingestion of surface soil	1.29E-06	9.05E-06	0.007	0.049
Site-wide Risk	1.29E-06	9.05E-06	0.007	0.049

Handout 11(c)
Impact of New Data on 2002 Risk Assessment for Trespasser in Former FF Building Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Ingestion of Surface Soil by Trespasser - Former FF Building Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Tetrachloroethene	7	285,000 *	7	2,000,000 M	7.0	7.46E-08	5.24E-07	0.0003	0.002
Trichloroethene	7	1,000 M	7	1,000 M	1.0	5.54E-11	5.54E-11	0.000002	0.000002
Total						7.47E-08	5.24E-07	0.0003	0.002

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

*: RME for tetrachloroethene is 2,000,000 ug/kg from Table A1-5-1 in RFI Data Gap Investigation Report (URS, July 2002).

Updated 2002 RA RME Site-wide Risks for Trespasser - Former FF Building Area

Complete Pathway and Site-wide Risk	Carcinogenic Risk		Non-carcinogenic Risk	
	2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Ingestion of surface soil	7.47E-08	5.24E-07	0.0003	0.002
Site-wide Risk	7.47E-08	5.24E-07	0.0003	0.002

Handout 11(d)

Impact of New Data on 2002 Risk Assessment for Indoor Site Worker in Former FF Building Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Inhalation of Vapors from Subsurface Soil by Indoor Site Worker - Former FF Building Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples*	Rep. Conc. (ug/kg)	Number of Samples**	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Tetrachloroethene	27	2,000,000 M	30	1,181,468 U	0.6	5.40E-04	3.19E-04	-	-
Trichloroethene	23	21,000 M	26	16,325 U	0.8	9.80E-06	7.62E-06	-	-
Total						5.50E-04	3.27E-04	-	-

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

*: All soil samples

**: Soil samples from 0 to groundwater table (11 ft)

Inhalation of Vapors from Groundwater by Indoor Site Worker - Former FF Building Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples*	Rep. Conc. (ug/L)	Number of Samples**	Rep. Conc. (ug/L)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Benzene	1	770	12	1,075 U	1.4	5.70E-07	7.96E-07	-	-
Chlorobenzene	1	2,300	12	9,671 U	4.2	-	-	0.02	0.08
cis/trans-1,2-Dichloroethene	1	4,100	12	32,739 U	8.0	-	-	0.02	0.16
Methylene chloride	1	1,250	12	1,500 M	1.2	2.60E-08	3.12E-08	0.00005	0.00006
Tetrachloroethene	1	3,800	12	17,569 U	4.6	5.20E-07	2.40E-06	-	-
Toluene	1	660,000	12	2,949,964 U	4.5	-	-	0.5	2.2
Trichloroethene	1	3,100	12	2,093 U	0.7	7.90E-07	5.33E-07	-	-
Vinyl chloride	1	2,400	12	2,061 U	0.9	1.10E-04	9.45E-05	-	-
Total						1.12E-04	9.82E-05	0.54	2.5

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

*: Only used data from well LPZ-4

**: Data from wells and piezometers in shallowest water zone since 2000

Updated 2002 RA RME Site-wide Risks for Indoor Site Worker - Former FF Building Area

Complete Pathway and Site-wide Risk	Carcinogenic Risk		Non-carcinogenic Risk	
	2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Inhalation of vapors from subsurface soil	5.50E-04	3.27E-04	-	-
Inhalation of vapors from groundwater	1.12E-04	9.82E-05	0.54	2.5
Site-wide Risk	6.62E-04	4.25E-04	0.54	2.5

Table 11(e)
Summary of Impact of New Data on 2002 Risk Assessment in Former FF Building Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Receptor	Site-Wide Carcinogenic Risk		Site-wide Non-carcinogenic Risk	
	2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Construction Worker	4.64E-08	1.80E-07	0.011	0.043
Outdoor Site Worker	1.29E-06	9.05E-06	0.007	0.049
Trespasser	7.47E-08	5.24E-07	0.0003	0.002
Indoor Site Worker	6.62E-04	4.25E-04	0.54	2.5

Handout 12(a)
Impact of New Data on 2002 Risk Assessment for Construction Worker in VV Building Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Ingestion of Soil by Construction Worker - VV Building Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Aroclor-1242	5	2,160,000 *	30	1,382,989 U	0.6	-	-	15	9.6
Aroclor-1260	5	21,000 M	30	190,000 M	9.0	-	-	0.2	1.8
Polychlorinated biphenyls	33	49,400 **	33	127,283 U	2.6	3.31E-07	8.53E-07	-	-
Total						3.31E-07	8.53E-07	15.2	11.4

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

*: RME for Aroclor-1242 is 3,400,000 ug/kg from Table A1-7-2 in RFI Data Gap Investigation Report (URS, July 2002).

**: RME for PCBs is 198,500 ug/kg from Table A1-7-2 in RFI Data Gap Investigation Report (URS, July 2002).

Dermal Contact with Soil by Construction Worker - VV Building Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Aroclor-1242	5	2,160,000 *	30	1,382,989 U	0.6	-	-	5	3.2
Aroclor-1260	5	21,000 M	30	190,000 M	9.0	-	-	0.05	0.5
Polychlorinated biphenyls	33	49,400 **	33	127,283 U	2.6	1.09E-07	2.81E-07	-	-
Total						1.09E-07	2.81E-07	5.1	3.7

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

*: RME for Aroclor-1242 is 3,400,000 ug/kg from Table A1-7-2 in RFI Data Gap Investigation Report (URS, July 2002).

**: RME for PCBs is 198,500 ug/kg from Table A1-7-2 in RFI Data Gap Investigation Report (URS, July 2002).

Updated 2002 RA RME Site-wide Risks for Construction Worker - VV Building Area

Complete Pathway and Site-wide Risk	Carcinogenic Risk		Non-carcinogenic Risk	
	2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Ingestion of soil	3.31E-07	8.53E-07	15.2	11.4
Dermal contact with soil	1.09E-07	2.81E-07	5.1	3.7
Site-wide Risk	4.40E-07	1.13E-06	20.3	15.1

Handout 12(b)

Impact of New Data on 2002 Risk Assessment for Outdoor Site Worker in VV Building Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Ingestion of Surface Soil by Outdoor Site Worker - VV Building Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Polychlorinated biphenyls	3	75,000 M	3	75,000 M	1.0	2.62E-05	2.62E-05	0.7	0.7
Total						2.62E-05	2.62E-05	0.7	0.7

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

Dermal Contact with Surface Soil by Outdoor Site Worker - VV Building Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Polychlorinated biphenyls	3	75,000 M	3	75,000 M	1.0	1.21E-05	1.21E-05	0.3	0.3
Total						1.21E-05	1.21E-05	0.3	0.3

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

Updated 2002 RA RME Site-wide Risks for Outdoor Site Worker - VV Building Area

	Complete Pathway and Site-wide Risk	Carcinogenic Risk		Non-carcinogenic Risk	
		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Ingestion of surface soil		2.62E-05	2.62E-05	0.7	0.7
Dermal contact with surface soil		1.21E-05	1.21E-05	0.3	0.3
Site-wide Risk		3.83E-05	3.83E-05	1.0	1.0

Handout 12(c)
Impact of New Data on 2002 Risk Assessment for Trespasser in VV Building Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Ingestion of Surface Soil by Trespasser - VV Building Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Polychlorinated biphenyls	3	75,000 M	3	75,000 M	1.0	1.51E-06	1.51E-06	0.04	0.04
Total						1.51E-06	1.51E-06	0.04	0.04

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

Dermal Contact with Surface Soil by Trespasser - VV Building Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Polychlorinated biphenyls	3	75,000 M	3	75,000 M	1.0	2.49E-07	2.49E-07	0.006	0.006
Total						2.49E-07	2.49E-07	0.006	0.006

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

Updated 2002 RA RME Site-wide Risks for Trespasser - VV Building Area

	Complete Pathway and Site-wide Risk	Carcinogenic Risk		Non-carcinogenic Risk	
		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Ingestion of surface soil		1.51E-06	1.51E-06	0.04	0.04
Dermal contact with surface soil		2.49E-07	2.49E-07	0.006	0.006
Site-wide Risk		1.76E-06	1.76E-06	0.046	0.046

Handout 12(d)

**Impact of New Data on 2002 Risk Assessment for Indoor Site Worker in VV Building Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri**

Inhalation of Vapors from Groundwater by Indoor Site Worker - VV Building Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples*	Rep. Conc. (ug/kg)	Number of Samples*	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
cis/trans-1,2-Dichloroethene	1	400	1	400 M	1.0	-	-	0.0007	0.0007
Tetrachloroethene	1	310	2	630 M	2.0	1.50E-08	3.05E-08	-	-
Trichloroethene	1	160	2	280 M	1.8	1.50E-08	2.63E-08	-	-
Vinyl chloride	1	14	2	25 M	1.8	2.70E-07	4.82E-07	-	-
Total						3.00E-07	5.39E-07	0.0007	0.0007

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

*: Data from well MW-3

Updated 2002 RA RME Site-wide Risks for Indoor Site Worker - VV Building Area

Complete Pathway and Site-wide Risk	Carcinogenic Risk		Non-carcinogenic Risk	
	2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Inhalation of vapors from groundwater	3.00E-07	5.39E-07	0.0007	0.0007
Site-wide Risk	3.00E-07	5.39E-07	0.0007	0.0007

Table 12(e)
Summary of Impact of New Data on 2002 Risk Assessment in VV Building Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Receptor	Site-Wide Carcinogenic Risk		Site-wide Non-carcinogenic Risk	
	2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Construction Worker	4.40E-07	1.13E-06	20.3	15.1
Outdoor Site Worker	3.83E-05	3.83E-05	1.0	1.0
Trespasser	1.76E-06	1.76E-06	0.046	0.046
Indoor Site Worker	3.00E-07	5.39E-07	0.0007	0.0007

Handout 13(a)
Impact of New Data on 2002 Risk Assessment for Construction Worker in Former Bulk Chemical Storage Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Ingestion of Soil by Construction Worker - Former Bulk Chemical Storage Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Chlorobenzene	24	307,000 *	34	679,540 U	2.2	-	-	0.005	0.011
Benzo(a)anthracene	24	36,000 U	24	32,361 U	0.9	8.82E-08	7.93E-08	-	-
Benzo(a)pyrene	24	22,000 U	24	21,413 U	1.0	5.39E-07	5.25E-07	-	-
Benzo(b)fluoranthene	24	24,000 U	24	23,919 U	1.0	5.88E-08	5.86E-08	-	-
Benzo(k)fluoranthene	24	18,000 U	24	9,285 U	0.5	4.41E-09	2.27E-09	-	-
Indeno(1,2,3-cd)pyrene	24	14,000 U	24	7,681 U	0.5	3.43E-08	1.88E-08	-	-
Naphthalene	24	39,000 U	24	117,760 U	3.0	-	-	0.0007	0.0021
Nitrobenzene	24	620 M	24	620 M	1.0	-	-	0.00004	0.00004
Antimony	24	8,700 U	24	15,399 U	1.8	-	-	0.008	0.014
Arsenic	24	15,000 U	24	15,387 U	1.0	7.55E-08	7.74E-08	0.02	0.021
Barium	24	1,100,000 U	24	1,004,501 U	0.9	-	-	0.006	0.0055
Beryllium	24	1,700 U	24	1,930 U	1.1	-	-	0.0001	0.00011
Cadmium	24	6,800 U	24	5,121 U	0.8	-	-	0.005	0.0038
Chromium	24	40,000 U	24	78,897 U	2.0	-	-	0.0007	0.0014
Lead	24	2,200,000 U	24	2,077,695 U	0.9	-	-	0.0004	0.00081
Thallium	24	1,000 U	24	2,017 U	2.0	-	-	0.046	0.059
Total						8.00E-07	7.61E-07		

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

*: RME for chlorobenzene is 1,500,000 ug/kg from Table A1-3-2 in RFI Data Gap Investigation Report (URS, July 2002).

Dermal Contact with Soil by Construction Worker - Former Bulk Chemical Storage Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Benzo(a)anthracene	24	36,000 U	24	32,361 U	0.9	2.91E-08	2.62E-08	-	-
Benzo(a)pyrene	24	22,000 U	24	21,413 U	1.0	1.78E-07	1.73E-07	-	-
Benzo(b)fluoranthene	24	24,000 U	24	23,919 U	1.0	1.94E-08	1.93E-08	-	-
Benzo(k)fluoranthene	24	18,000 U	24	9,285 U	0.5	1.45E-09	7.48E-10	-	-
Indeno(1,2,3-cd)pyrene	24	14,000 U	24	7,681 U	0.5	1.13E-08	6.20E-09	-	-
Naphthalene	24	39,000 U	24	117,760 U	3.0	-	-	0.000002	0.000006
Nitrobenzene	24	620 M	24	620 M	1.0	-	-	0.0000001	0.0000001
Total						2.39E-07	2.26E-07	0.0000021	0.0000061

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

*: RME for chlorobenzene is 1,500,000 ug/kg from Table A1-3-2 in RFI Data Gap Investigation Report (URS, July 2002).

Handout 13(a)
Impact of New Data on 2002 Risk Assessment for Construction Worker in Former Bulk Chemical Storage Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Inhalation of Vapors from Soil by Construction Worker - Former Bulk Chemical Storage Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Chlorobenzene	24	307,000 *	34	679,540 U	2.2	-	-	0.04	0.089
Naphthalene	24	39,000 U	24	117,760 U	3.0	-	-	0.01	0.03
Nitrobenzene	24	620 M	24	620 M	1.0	-	-	0.0001	0.0001
Total						-	-	0.05	0.12

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

*: RME for chlorobenzene is 1,500,000 ug/kg from Table A1-3-2 in RFI Data Gap Investigation Report (URS, July 2002).

Updated 2002 RA RME Site-wide Risks for Construction Worker - Former Bulk Chemical Storage Area

Complete Pathway and Site-wide Risk	Carcinogenic Risk		Non-carcinogenic Risk	
	2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Ingestion of soil	8.00E-07	7.61E-07	0.046	0.059
Dermal contact with soil	2.39E-07	2.26E-07	0.0000021	0.0000061
Inhalation of vapors from soil	-	-	0.05	0.12
Site-wide Risk	1.04E-06	9.87E-07	0.10	0.18

Handout 13(b)

**Impact of New Data on 2002 Risk Assessment for Outdoor Site Worker in Former Bulk Chemical Storage Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri**

Ingestion of Surface Soil by Outdoor Site Worker - Former Bulk Chemical Storage Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Benzo(a)anthracene	2	6,100 M	2	6,100 M	1.0	7.78E-07	7.78E-07	-	-
Benzo(a)pyrene	2	4,000 M	2	4,000 M	1.0	5.10E-06	5.10E-06	-	-
Benzo(b)fluoranthene	2	4,600 M	2	4,600 M	1.0	5.87E-07	5.87E-07	-	-
Antimony	2	11,000 M	2	11,000 M	1.0	-	-	0.01	0.01
Arsenic	2	42,000 M	2	42,000 M	1.0	1.10E-05	1.10E-05	0.07	0.07
Beryllium	2	1,200 M	2	1,200 M	1.0	-	-	0.0003	0.0003
Chromium	2	270,000 M	2	270,000 M	1.0	-	-	0.04	0.04
Lead	2	1,100,000 M	2	1,100,000 M	1.0	-	-	-	-
Thallium	2	1,200 M	2	1,200 M	1.0	-	-	0.007	0.007
Total						1.75E-05	1.75E-05	0.13	0.13

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

Dermal Contact with Surface Soil by Outdoor Site Worker - Former Bulk Chemical Storage Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Benzo(a)anthracene	2	6,100 M	2	6,100 M	1.0	3.59E-07	3.59E-07	-	-
Benzo(a)pyrene	2	4,000 M	2	4,000 M	1.0	2.36E-06	2.36E-06	-	-
Benzo(b)fluoranthene	2	4,600 M	2	4,600 M	1.0	2.71E-07	2.71E-07	-	-
Total						2.99E-06	2.99E-06	-	-

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

Updated 2002 RA RME Site-wide Risks for Outdoor Site Worker - Former Bulk Chemical Storage Area

	Complete Pathway and Site-wide Risk	Carcinogenic Risk		Non-carcinogenic Risk	
		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Ingestion of surface soil		1.75E-05	1.75E-05	0.13	0.13
Dermal contact with surface soil		2.99E-06	2.99E-06	-	-
Site-wide Risk		2.05E-05	2.05E-05	0.13	0.13

Handout 13(c)

**Impact of New Data on 2002 Risk Assessment for Trespasser in Former Bulk Chemical Storage Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri**

Ingestion of Surface Soil by Trespasser - Former Bulk Chemical Storage Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Benzo(a)anthracene	2	6,100 M	2	6,100 M	1.0	4.48E-08	4.48E-08	-	-
Benzo(a)pyrene	2	4,000 M	2	4,000 M	1.0	2.94E-07	2.94E-07	-	-
Benzo(b)fluoranthene	2	4,600 M	2	4,600 M	1.0	3.38E-08	3.38E-08	-	-
Antimony	2	11,000 M	2	11,000 M	1.0	-	-	0.0006	0.0006
Arsenic	2	42,000 M	2	42,000 M	1.0	6.34E-07	6.34E-07	0.003	0.003
Beryllium	2	1,200 M	2	1,200 M	1.0	-	-	0.000006	0.000006
Chromium	2	270,000 M	2	270,000 M	1.0	-	-	0.0003	0.0003
Lead	2	1,100,000 M	2	1,100,000 M	1.0	-	-	0.00004	0.00004
Thallium	2	1,200 M	2	1,200 M	1.0	-	-	-	-
Total						1.01E-06	1.01E-06	0.0039	0.0039

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

Dermal Contact with Surface Soil by Trespasser - Former Bulk Chemical Storage Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Benzo(a)anthracene	2	6,100 M	2	6,100 M	1.0	7.39E-09	7.39E-09	-	-
Benzo(a)pyrene	2	4,000 M	2	4,000 M	1.0	4.85E-08	4.85E-08	-	-
Benzo(b)fluoranthene	2	4,600 M	2	4,600 M	1.0	5.58E-09	5.58E-09	-	-
Total						6.15E-08	6.15E-08	-	-

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

Updated 2002 RA RME Site-wide Risks for Trespasser - Former Bulk Chemical Storage Area

	Complete Pathway and Site-wide Risk	Carcinogenic Risk		Non-carcinogenic Risk	
		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Ingestion of surface soil		1.01E-06	1.01E-06	0.0039	0.0039
Dermal contact with surface soil		6.15E-08	6.15E-08	-	-
Site-wide Risk		1.07E-06	1.07E-06	0.0039	0.0039

Handout 13(d)

**Impact of New Data on 2002 Risk Assessment for Indoor Site Worker in Former Bulk Chemical Storage Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri**

Inhalation of Vapors from Subsurface Soil by Indoor Site Worker - Former Bulk Chemical Storage Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples*	Rep. Conc. (ug/kg)	Number of Samples**	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Chlorobenzene	26	1,005,000 M	36	341,438 U	0.3	-	-	3	1.0
Naphthalene	26	290,000 M	25	59,011 U	0.2	-	-	0.001	0.0002
Nitrobenzene	26	620 M	25	620 M	1.0	-	-	0.0003	0.0003
Total						-	-	3.0	1.0

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

*: All soil samples

**: Soil samples from 0 to groundwater table (11 ft)

Inhalation of Vapors from Groundwater by Indoor Site Worker - Former Bulk Chemical Storage Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples*	Rep. Conc. (ug/L)	Number of Samples**	Rep. Conc. (ug/L)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Benzene	1	15,000	19	18,000 M	1.2	4.10E-06	4.92E-06	-	-
Chlorobenzene	1	4,800	18	4,836 U	1.0	-	-	0.01	0.01
Chloromethane	1	6.8	18	807 U	119	-	-	0.000008	0.0009
Total						4.10E-06	4.92E-06	0.01	0.011

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

*: Only used data from well VW-1

**: Data from wells and piezometers in shallowest water zone since 2000

Updated 2002 RA RME Site-wide Risks for Indoor Site Worker - Former Acetanilides Production Area

	Complete Pathway and Site-wide Risk	Carcinogenic Risk		Non-carcinogenic Risk	
		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Inhalation of vapors from subsurface soil		-	-	3.0	1.0
Inhalation of vapors from groundwater		4.10E-06	4.92E-06	0.01	0.011
Site-wide Risk		4.10E-06	4.92E-06	3.0	1.03

Table 13(e)
Summary of Impact of New Data on 2002 Risk Assessment in Former Bulk Chemical Storage Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Receptor	Site-Wide Carcinogenic Risk		Site-wide Non-carcinogenic Risk	
	2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Construction Worker	1.04E-06	9.87E-07	0.10	0.18
Outdoor Site Worker	2.05E-05	2.05E-05	0.13	0.13
Trespasser	1.07E-06	1.07E-06	0.0039	0.0039
Indoor Site Worker	4.10E-06	4.92E-06	3.0	1.03

Handout 14(a)
Impact of New Data on 2002 Risk Assessment for Construction Worker in Former Acetanilides Production Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Ingestion of Soil by Construction Worker - Former Acetanilides Production Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Alachlor	31	46,100	U	35	56,374	U	1.2	1.24E-08	1.52E-08
Benzo(a)pyrene	3	1,100	M	3	1,100	M	1.0	2.69E-08	2.69E-08
Chlorobenzene	33	6,700	*	40	78,201	U	11.7	-	-
Tetrachloroethylene	33	10	M	40	10	M	1.0	1.74E-12	1.74E-12
Trichloroethylene	33	940	M	40	940	M	1.0	3.47E-11	3.47E-11
Arsenic	3	7,500	M	3	7,500	M	1.0	3.77E-08	3.77E-08
Beryllium	3	450	M	3	450	M	1.0	-	-
Mercury	3	7,600	M	3	7,600	M	1.0	-	-
Total							7.70E-08	7.98E-08	0.020
									0.022

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

*: RME for chlorobenzene is 59,000 ug/kg from Table A1-1-3 in RFI Data Gap Investigation Report (URS, July 2002).

Dermal Contact with Soil by Construction Worker - Former Acetanilides Production Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Alachlor	31	46,100	U	35	56,374	U	1.2	4.08E-09	4.99E-09
Benzo(a)pyrene	3	1,100	M	3	1,100	M	1.0	8.89E-09	8.89E-09
Total							1.30E-08	1.39E-08	0.0005
									0.0006

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

Inhalation of Vapors from Soil by Construction Worker - Former Acetanilides Production Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Chlorobenzene	33	6,700	*	40	78,201	U	11.7	-	-
Tetrachloroethylene	33	10	M	40	10	M	1.0	7.99E-13	7.99E-13
Trichloroethylene	33	940	M	40	940	M	1.0	1.96E-10	1.96E-10
Total							1.97E-10	1.97E-10	0.0009
									0.011

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

*: RME for chlorobenzene is 59,000 ug/kg from Table A1-1-3 in RFI Data Gap Investigation Report (URS, July 2002).

Handout 14(a)
Impact of New Data on 2002 Risk Assessment for Construction Worker in Former Acetanilides Production Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Ingestion of Groundwater by Construction Worker - Former Acetanilides Production Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples*	Rep. Conc. (ug/L)	Number of Samples**	Rep. Conc. (ug/L)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Alachlor	1	13	14	899,233 U	69172	3.49E-11	2.41E-06	0.000005	0.346
Chlorobenzene	1	70,000	16	73,639 U	1.1	-	-	0.01	0.0105
1,2-Dichloroethane	1	1,250	16	19 M	0.0	3.82E-09	5.81E-11	0.0001	0.000002
cis/trans-1,2-Dichloroethene	1	1,250	15	82 M	0.1	-	-	0.0005	0.00003
Ethyl methacrylate	1	1,400	16	1,400 M	1.0	-	-	0.00006	0.0001
Methylene chloride	1	1,250	16	1,198 U	1.0	3.15E-10	3.02E-10	0.00007	0.0001
Tetrachloroethylene	1	1,250	16	380 M	0.3	2.18E-09	6.63E-10	0.0004	0.0001
Trichloroethylene	1	1,250	16	100 M	0.1	4.61E-10	3.69E-11	0.0007	0.00006
Vinyl chloride	1	125	16	3.3 M	0.0	3.15E-09	8.32E-11	0.0001	0.000003
Benzo(a)anthracene	1	0.39	3	2.3 M	5.9	9.55E-12	5.63E-11	-	-
Benzo(a)pyrene	1	5	3	1.2 M	0.2	1.22E-09	2.93E-10	-	-
Benzo(b)fluoranthene	1	5	3	1.5 M	0.3	1.22E-10	3.66E-11	-	-
Benzo(k)fluoranthene	1	5	3	1.3 M	0.3	1.22E-11	3.17E-12	-	-
Dibenzo(a,h)anthracene	1	5	3	0.88 M	0.2	1.22E-09	2.15E-10	-	-
Indeno(1,2,3-cd)pyrene	1	5	3	0.92 M	0.2	1.22E-10	2.24E-11	-	-
Arsenic	1	26	8	32 U	1.2	1.31E-09	1.59E-09	0.0003	0.0004
Total						1.40E-08	2.42E-06	0.012	0.36

Notes:

M: Maximum detected concentration

*: Only used data from well GM-2

U: 95% upper confidence limit

**: Data from all monitoring wells and piezometers since 2000

Dermal Contact with Groundwater by Construction Worker - Former Acetanilides Production Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples*	Rep. Conc. (ug/L)	Number of Samples	Rep. Conc. (ug/L)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Alachlor	1	13	14	899,233 U	69172	1.13E-09	7.82E-05	0.0002	13.8
Benzo(a)anthracene	1	0.39	3	2.3 M	5.9	5.11E-08	3.01E-07	-	-
Benzo(a)pyrene	1	5	3	1.2 M	0.2	9.70E-06	2.33E-06	-	-
Benzo(b)fluoranthene	1	5	3	1.5 M	0.3	9.70E-07	2.91E-07	-	-
Benzo(k)fluoranthene	1	5	3	1.3 M	0.3	4.85E-08	1.26E-08	-	-
Dibenzo(a,h)anthracene	1	5	3	0.88 M	0.2	2.18E-05	3.84E-06	-	-
Indeno(1,2,3-cd)pyrene	1	5	3	0.92 M	0.2	1.54E-06	2.83E-07	-	-
Total						3.41E-05	8.52E-05	0.0002	13.8

Notes:

M: Maximum detected concentration

*: Only used data from well MW-4

U: 95% upper confidence limit

**: Data from all monitoring wells and piezometers since 2000

Handout 14(a)
Impact of New Data on 2002 Risk Assessment for Construction Worker in Former Acetanilides Production Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Inhalation of Vapors from Groundwater by Construction Worker - Former Acetanilides Production Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk		
	Number of Samples*	Rep. Conc. (ug/L)	Number of Samples	Rep. Conc. (ug/L)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA	
Chlorobenzene	1	70,000	16	73,639	U	1.1	-	0.8	0.84	
1,2-Dichloroethane	1	1,250	16	19	M	0.02	2.09E-07	3.18E-09	0.2	0.003
cis/trans-1,2-Dichloroethene	1	1,250	15	82	M	0.1	-	-	-	-
Ethyl methacrylate	1	1,400	16	1,400	M	1.0	-	-	-	-
Methylene chloride	1	1,250	16	1,198	U	1.0	3.78E-09	3.62E-09	0.0003	0.0003
Tetrachloroethylene	1	1,250	16	380	M	0.3	4.58E-09	1.39E-09	0.002	0.0006
Trichloroethylene	1	1,250	16	100	M	0.1	1.38E-08	1.10E-09	-	-
Vinyl chloride	1	125	16	3.3	M	0.03	3.44E-09	9.08E-11	0.0009	0.00002
Total						2.35E-07	9.39E-09	1.0	0.85	

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

*: Only used data from well GM-2

Updated 2002 RA RME Site-wide Risks for Construction Worker - Former Acetanilides Production Area

Complete Pathway and Site-wide Risk	Carcinogenic Risk		Non-carcinogenic Risk	
	2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Ingestion of soil	7.70E-08	7.98E-08	0.02	0.02
Dermal contact with soil	1.30E-08	1.39E-08	0.0005	0.0006
Inhalation of vapors from soil	1.97E-10	1.97E-10	0.0009	0.011
Ingestion of groundwater	1.40E-08	2.42E-06	0.012	0.36
Dermal contact with groundwater	3.41E-05	8.52E-05	0.0002	13.8
Inhalation of vapors from groundwater	2.35E-07	9.39E-09	1.0	0.85
Site-wide Risk	3.44E-05	8.77E-05	1.0	15.1

Handout 14(b)

Impact of New Data on 2002 Risk Assessment for Outdoor Site Worker in Former Acetanilides Production Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Ingestion of Surface Soil by Outdoor Site Worker - Former Acetanilides Production Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Benzo(a)pyrene	2	1,100 M	2	1,100 M	1.0	1.40E-06	1.40E-06	-	-
Chlorobenzene	12	13,900 *	13	59,000 M	4.2	-	-	0.0003	0.00127
Arsenic	2	7,500 M	2	7,500 M	1.0	1.97E-06	1.97E-06	0.01	0.01
Beryllium	2	450 M	2	450 M	1.0	-	-	0.0001	0.0001
Mercury	2	7,600 M	2	7,600 M	1.0	-	-	0.01	0.01
Total						3.37E-06	3.37E-06	0.02	0.021

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

*: RME for chlorobenzene is 59,000 ug/kg from Table A1-1-1 in RFI Data Gap Investigation Report (URS, July 2002).

Dermal Contact with Surface Soil by Outdoor Site Worker - Former Acetanilides Production Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Benzo(a)pyrene	2	1,100 M	2	1,100 M	1.0	6.48E-07	6.48E-07	-	-
Total						6.48E-07	6.48E-07	-	-

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

Updated 2002 RA RME Site-wide Risks for Outdoor Site Worker - Former Acetanilides Production Area

	Complete Pathway and Site-wide Risk	Carcinogenic Risk		Non-carcinogenic Risk	
		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Ingestion of surface soil		3.37E-06	3.37E-06	0.02	0.021
Dermal contact with surface soil		6.48E-07	6.48E-07	-	-
Site-wide Risk		4.02E-06	4.02E-06	0.02	0.021

Handout 14(c)

**Impact of New Data on 2002 Risk Assessment for Trespasser in Former Acetanilides Production Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri**

Ingestion of Surface Soil by Trespasser - Former Acetanilides Production Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Benzo(a)pyrene	2	1,100 M	2	1,100 M	1.0	8.08E-08	8.08E-08	-	-
Chlorobenzene	12	13,900 *	13	59,000 M	4.2	-	-	0.00002	0.00008
Arsenic	2	7,500 M	2	7,500 M	1.0	1.13E-07	1.13E-07	0.0006	0.0006
Beryllium	2	450 M	2	450 M	1.0	-	-	0.000005	0.000005
Mercury	2	7,600 M	2	7,600 M	1.0	-	-	0.0006	0.001
Total						1.94E-07	1.94E-07	0.0012	0.0013

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

*: RME for chlorobenzene is 59,000 ug/kg from Table A1-1-1 in RFI Data Gap Investigation Report (URS, July 2002).

Dermal Contact with Surface Soil by Trespasser - Former Acetanilides Production Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples	Rep. Conc. (ug/kg)	Number of Samples	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Benzo(a)pyrene	2	1,100 M	2	1,100 M	1.0	1.33E-08	1.33E-08	-	-
Total						1.33E-08	1.33E-08	-	-

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

Updated 2002 RA RME Site-wide Risks for Trespasser - Former Acetanilides Production Area

	Complete Pathway and Site-wide Risk	Carcinogenic Risk		Non-carcinogenic Risk	
		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Ingestion of surface soil		1.94E-07	1.94E-07	0.0012	0.0013
Dermal contact with surface soil		1.33E-08	1.33E-08	-	-
Site-wide Risk		2.07E-07	2.07E-07	0.0012	0.0013

Handout 14(d)

Impact of New Data on 2002 Risk Assessment for Indoor Site Worker in Former Acetanilides Production Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Inhalation of Vapors from Subsurface Soil by Indoor Site Worker - Former Acetanilides Production Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples*	Rep. Conc. (ug/kg)	Number of Samples**	Rep. Conc. (ug/kg)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Chlorobenzene	33	59,000 M	29	23,267 U	0.4	-	-	0.6	0.2
Tetrachloroethene	33	10 M	29	10 M	1.0	1.20E-09	1.20E-09	-	-
Trichloroethene	33	940 M	29	890 M	0.9	4.10E-07	3.88E-07	-	-
Total						4.11E-07	3.89E-07	0.6	0.2

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

*: All soil samples

**: Soil samples from 0 to groundwater table (7 ft)

Inhalation of Vapors from Groundwater by Indoor Site Worker - Former Acetanilides Production Area

Constituents	2002 RA RME		Updated 2002 RA RME		Ratio of Updated 2002 RA/2002 RA	Carcinogenic Risk		Non-carcinogenic Risk	
	Number of Samples*	Rep. Conc. (ug/L)	Number of Samples**	Rep. Conc. (ug/L)		2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Benzene	1	1,250	16	0.67 M	0.001	9.40E-07	5.04E-10	-	-
Chlorobenzene	1	70,000	16	73,639 U	1.1	-	-	0.5	0.5
Chloromethane	1	2,500	16	3,835 U	1.5	-	-	0.009	0.01
1,2-Dichloroethane	1	1,250	16	19 M	0.02	6.40E-07	9.73E-09	-	-
cis/trans-1,2-Dichloroethene	1	1,250	6	82 M	0.1	-	-	0.007	0.0005
Ethyl methacrylate	1	1,400	16	1,400 M	1.0	-	-	-	-
Methylene chloride	1	1,250	16	1,198 U	1.0	2.60E-08	2.49E-08	0.00005	0.00005
Tetrachloroethene	1	1,250	16	380 M	0.3	1.70E-07	5.17E-08	-	-
Trichloroethene	1	1,250	16	100 M	0.1	3.20E-07	2.56E-08	-	-
Vinyl chloride	1	125	16	3.3 M	0.03	5.70E-06	1.50E-07	-	-
Total						7.80E-06	2.63E-07	0.5	0.5

Notes:

M: Maximum detected concentration

U: 95% upper confidence limit

*: Only used data from well GM-2

**: Data from all monitoring wells and piezometers since 2000

Handout 14(d)

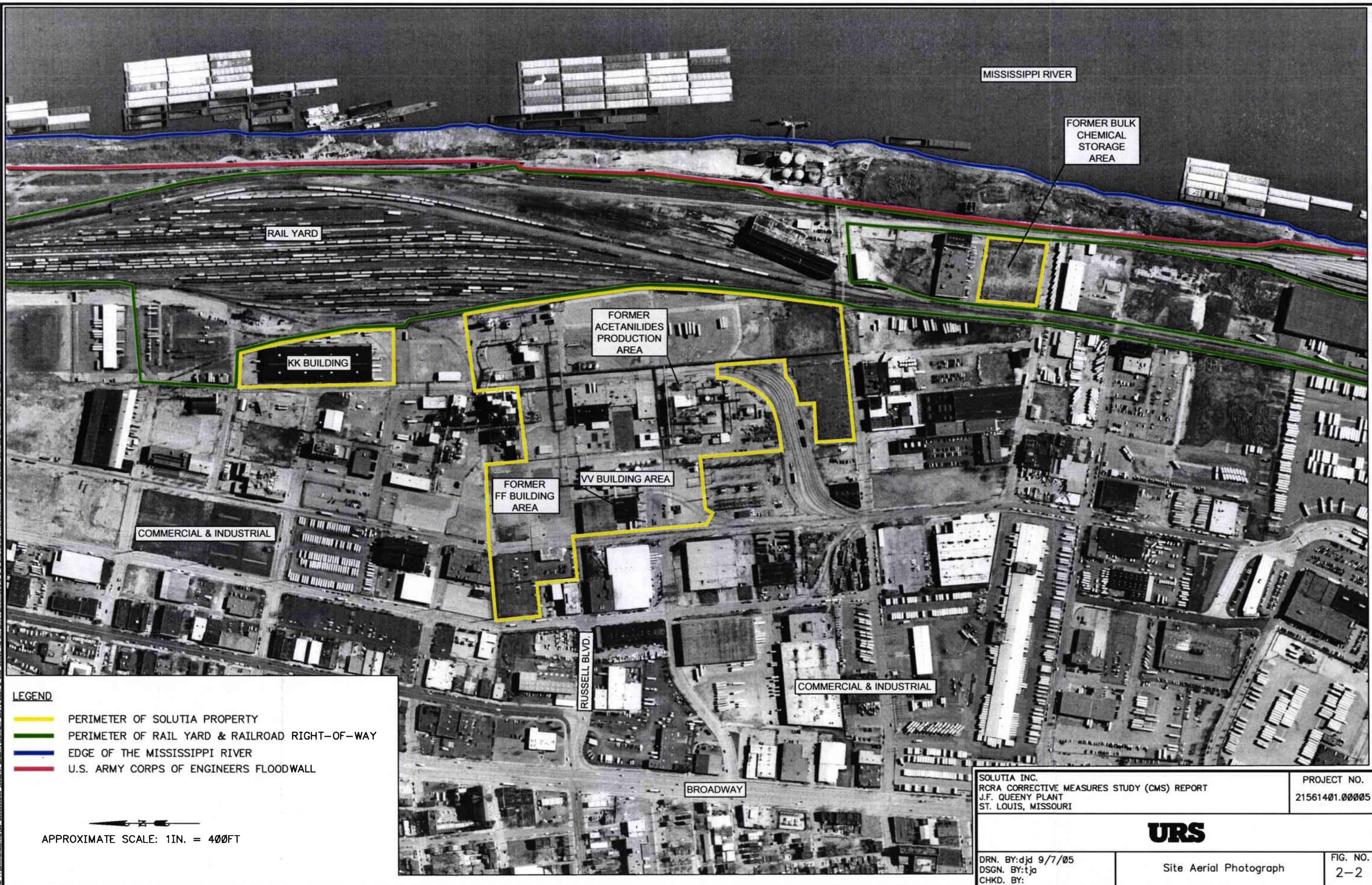
Impact of New Data on 2002 Risk Assessment for Indoor Site Worker in Former Acetanilides Production Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Updated 2002 RA RME Site-wide Risks for Indoor Site Worker - Former Acetanilides Production Area

Complete Pathway and Site-wide Risk	Carcinogenic Risk		Non-carcinogenic Risk	
	2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Inhalation of vapors from subsurface soil	4.11E-07	3.89E-07	0.6	0.2
Inhalation of vapors from groundwater	7.80E-06	2.63E-07	0.5	0.5
Site-wide Risk	8.21E-06	6.52E-07	1.1	0.8

Table 14(e)
Summary of Impact of New Data on 2002 Risk Assessment in Former Acetanilides Production Area
Solutia - J.F. Queeny Plant, St. Louis, Missouri

Receptor	Site-Wide Carcinogenic Risk		Site-wide Non-carcinogenic Risk	
	2002 RA	Updated 2002 RA	2002 RA	Updated 2002 RA
Construction Worker	3.44E-05	8.77E-05	1.0	15.1
Outdoor Site Worker	4.02E-06	4.02E-06	0.02	0.021
Trespasser	2.07E-07	2.07E-07	0.0012	0.0013
Indoor Site Worker	8.21E-06	6.52E-07	1.1	0.8





NOTE:
SWMUs OR AOCs NOT INVESTIGATED DURING THE
IMPLEMENTATION OF THE CMS WORK PLAN ARE
SHOWN IN GRAY SCALE.

SOLUTIA INC.
RCRA CORRECTIVE MEASURES STUDY (CMS) REPORT
J.F. QUEENY PLANT
ST. LOUIS, MISSOURI

PROJECT NO.
21561401.00005

URS

DRN. BY: djd 9/6/05
DSGN. BY: tja
CHKD. BY:

Solid Waste Management Unit
Location Map

FIG. NO.
2-3



LEGEND (GROUNDWATER MONITORING WELLS AND PIEZOMETERS)

- ◆ LPZ-5 WELLS SCREENED IN THE FILL & SILTY CLAY
- MW-7A WELLS SCREENED IN THE SAND
- MW-2R WELLS SCREENED IN THE BEDROCK

NOTES:

1. LOCATION OF MISSISSIPPI RIVER IS APPROXIMATE.
2. THIS FIGURE DEPICTS THE PRIMARY SCREENED INTERVAL FOR WELLS; IN SOME CASES, WELL SCREENS MAY EXTEND ACROSS STRATIGRAPHIC UNITS.

REFERENCE:
RCRA FACILITY INVESTIGATION
DATA GAP WORK PLAN JOHN
F. QUEENY PLANT BY O'BRIEN
& GERE ENGINEERS, INC.,
SEPTEMBER 1999

Revision No.	Description	Date	By	App.
REVISIONS				

SOLUTIA INC. RFI DATA GAP INVESTIGATION J. F. QUEENY PLANT ST. LOUIS MISSOURI
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Monitoring Well and Piezometer Location Map

Date: 6/20/01	Project Number: 23-2000058.00	Drawing Number: 3-2
Drawn by: chs/djd	Design by: tja	Checked by:

URS